What is claimed is:

1. An epitaxial structure of GaN based compound semiconductor comprising:

a substrate;

a single crystal of boron phosphide buffer layer on said substrate;

a first buffer layer composed of group III nitride at a temperature from 200 to 800 degree C formed on said boron phosphide buffer layer; and

a second buffer layer composed of group III nitride at a temperature from 800 to 1100 degree C formed on said first buffer layer.

2. The epitaxial structure of GaN based compound semiconductor of claim 1, wherein said substrate is a single crystal silicon.

3. The epitaxial structure of GaN based compound semiconductor of claim 1, wherein said boron phosphide buffer layer comprises a first layer formed at a temperature from 300 to 850 degree C and a second layer formed at a temperature from 800 to 1100 degree C.

4. The epitaxial structure of GaN based compound semiconductor of claim 1, wherein said first and second buffer layer are composed of $Al_xIn_yGa_zN$, wherein $0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 1$, $x+y+z=1$.

5. The epitaxial structure of GaN based compound semiconductor of claim 1, wherein said first and second buffer layer are composed of $In_xGa_yN_zP$, wherein $0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 1$, $x+y+z=1$.

6. A process of epitaxial structure of GaN based compound semiconductor, comprising the steps of:

providing a substrate;

growing a single crystal of boron phosphide buffer layer on said substrate;

growing a first buffer layer composed of group III nitride formed on said boron phosphide buffer layer at a temperature from 200 to 800 degree C;

and growing a second buffer layer composed of group III nitride formed on said first buffer layer at a temperature from 800 to 1100 degree C.

7. The process of epitaxial structure of GaN based compound semiconductor of claim 6, wherein said substrate is a single crystal silicon.

8. The process of epitaxial structure of GaN based compound semiconductor of claim 6, wherein said boron phosphide buffer layer comprises a first layer formed at a temperature from 300 to 850 degree C and a second layer formed at a temperature from 800 to 1100 degree C.

9. The process of epitaxial structure of GaN based compound semiconductor of claim 6, wherein said first and second buffer layer are composed of $Al_xIn_yGa_zN$, wherein $0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 1$, $x+y+z=1$.

10. The process of epitaxial structure of GaN based compound semiconductor of claim 6, wherein said first and second buffer layer are composed of $In_xGa_yN_zP$, wherein $0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 1$, $x+y+z=1$.